

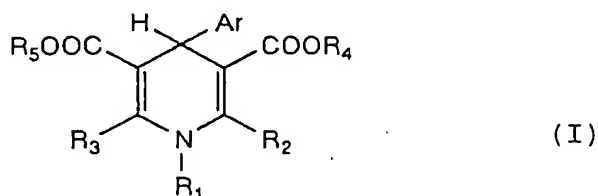
WHAT IS CLAIMED IS:

1. A process for producing a polyimide optical waveguide, which comprises the steps of:
  - (a) forming an undercladding layer on a substrate,
  - (b) forming a photosensitive polyimide resin precursor composition layer on the undercladding layer,
  - (c) irradiating the photosensitive polyimide resin precursor composition layer, excepting a region corresponding to a core pattern, with a UV light through a mask, followed by heating after exposure,
  - (d) removing a UV-unexposed area of the photosensitive polyimide resin precursor composition layer by development,
  - (e) heating a UV-exposed area of the photosensitive polyimide resin precursor composition layer to imidize the UV-exposed area, thereby forming a cladding layer having a desired pattern,
  - (f) coating the region corresponding to the core pattern and a surface of the cladding layer with a polyamic acid that forms a polyimide resin having a higher refraction index than the polyimide resin of the cladding layer, and imidizing the polyamic acid by heating to form a core layer, and
  - (g) forming an overcladding layer on the core layer,

wherein the photosensitive polyimide resin precursor composition comprises:

(i) a polyamic acid obtained from a tetracarboxylic dianhydride and a diamine; and

(ii) a photosensitive agent comprising a 1,4-dihydropyridine derivative represented by formula (I):



wherein Ar represents an aromatic group having a nitro group at an ortho-position with respect to the bonding position to the 1,4-dihydropyridine ring; R<sub>1</sub> represents a hydrogen atom or an alkyl group having 1 to 3 carbon atoms; and R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub> and R<sub>5</sub> each independently represents a hydrogen atom or an alkyl group having 1 or 2 carbon atoms.

2. The process according to claim 1, wherein the photosensitive polyimide resin precursor composition contains the photosensitive agent in an amount of 0.05 to 10 parts by weight per 100 parts by weight of the polyamic acid.

3. The process according to claim 1 or 2, wherein the photosensitive polyimide resin precursor composition further contains at least one dissolution controlling agent selected from the group consisting of polyethylene glycol, polyethylene glycol monomethyl ether and polyethylene glycol dimethyl ether.

4. The process according to claim 1, wherein the tetracarboxylic dianhydride contains a fluorine atom.

5. The process according to claim 1, wherein the diamine contains a fluorine atom.

6. The process according to claim 1, wherein the 1,4-dihydropyridine derivative represented by formula (I) comprises 1-ethyl-3,5-dimethoxycarbonyl-4-(2-nitrophenyl)-1,4-dihydropyridine.

7. The process according to claim 3, wherein the dissolution controlling agent has a weight-average molecular weight of from 200 to 2,000.

8. The process according to claim 3, wherein the dissolution controlling agent has a weight-average molecular weight of from 300 to 1,000.

9. The process according to claim 3, wherein the photosensitive polyimide resin precursor composition contains the dissolution controlling agent in an amount of from 5 to 50 parts by weight per 100 parts by weight of the polyamic acid.

10. The process according to claim 3, wherein the photosensitive polyimide resin precursor composition contains the dissolution controlling agent in an amount of from 10 to 40 parts by weight per 100 parts by weight of the polyamic acid.

11. A polyimide optical waveguide produced by a process according to claim 1.